Pharmacotherapy in the practice of a paramedic in primary headache

(Farmakoterapia w praktyce ratownika medycznego w pierwotnym bólu głowy)

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Abstract – Introduction. There are analgesics and diastolic drugs that can be administered by a paramedic on their own, without a medical descriptio.
The aim of the study. The aim of the study was to present the characteristics of drugs that can be coordinated by a paramedic in the treatment of pain.
Selection of material. The search was conducted in the Scopus database using the terms of *analgesic therapy*, *paramedic* 2001-2018. The literature found in the Google Scholar database was analysed for the highest number of citations. The literature selected in this way was used as the material for this work.
Conclusions. Competent behaviour of a paramedic at the place of the incident in a patient with headache requires the paramedic to know the mechanisms of action of drugs that the paramedic can administer on his/her own and to be able to assess the effectiveness of the analgesic treatment provided.

Key words – pain relief, paramedic.

Streszczenie – Wstęp. Istnieją leki analgetyczne i rozkurczowe, które mogą podawać samodzielnie, bez ordynacji lekarskiej, przez ratownika medycznego.
Cel pracy. Celem pracy było przedstawienie charakterystyki leków możliwych do zaordynowania przez ratownika medycznego w leczeniu dolegliwości bólowych.
Dobór materiału. Poszukiwania przeprowadzono w bazie Scopus używając pojęć *terapia przeciwbólowa, ratownik medyczny* 2001-2018r. Znalezione piśmiennictwo w bazie Google Scholar przeanalizowano pod kątem największej liczby cytowań. Tak wyselekcjonowane piśmiennictwo posłużyło za materiał do opracowania niniejszej pracy.
Wnioski. Kompetentne zachowanie ratownika medycznego na miejscu zdarzenia u chorego z bólem głowy, wymaga znajomości przez ratownika medycznego mechanizmów działania leków , które ratownik samodzielnie może podać oraz umiejętności oceny skuteczności prowadzonego leczenia przeciwbólowego.

Słowa kluczowe – terapia przeciwbólowa, ratownik medyczny.

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I. ANALGESICS AND DIASTOLIC DRUGS

Analgesic and diastolic drugs, which can be administered by a paramedic on their own, without a medical order, are [1-4] :

- drotaverine (only pain located in the abdominal cavity with a spastic component).
- fentanyl
- ibuprofen
- ketoprofen
- metamizol

- morphine
- papaverine (only pain located in the abdominal cavity with a spastic component)
- paracetamol

The rescuer should assess the severity of the pain on site. For this purpose descriptive scales are used, often selected according to the age of the patient.

The severity of pain should be documented in the patient's card both before and after the administration of the drug. For instance, the following classification of pain severity should be used [5]:

- mild pain: from 1 point to 4 points
- moderate pain: 5 to 7 points
- severe/extreme pain: between 8 points and 10 points

In the recommendations of the Ministry of Health, the pain is also divided into [2]:

- non-traumatic pain (head, chest, abdomen)
- traumatic pain.

According to the above division, appropriate analgesic pharmacotherapy is recommended (Table 1).

II. MILD HEADACHE

Ibuprofen

Mechanism of action of the drug and contraindications for its use Ibuprofen is a non-steroidal anti-inflammatory drug (NSAID), a derivative of propionic acid. It inhibits the action of cyclooxygenases (COX-1 and COX-2), the enzymes responsible for the for
mation of prostaglandins, which take part in the formation of the body's anti-inflammatory response. It reduces swelling, has an analgesic and antipyretic effect. Additionally, it slightly inhibits platelet aggregation.
It cannot be used in patients with gastric ulcers, patients with severe kidney and/or liver failure, women in the third trimester of pregnancy and patients with hemorrhagic bleeding. It cannot be combined with other NSAIDs[6].

Paracetamol

Mechanism of action of the drug and contraindications for its use Paracetamol has a very weak anti-inflammatory effect. It only inhibits COX 3 in the brain and spinal cord, it does not inhibit cyclooxygenases in peripheral tissues.
The contraindications for its use are severe kidney and/or liver failure, first trimester pregnancy and alcoholic disease. [6]

Table 1. Pain relief therapy in the practice of paramedics [1-4]

Pain Intensity (NRS)	**Pain of non-traumatic etiology**			**Pain of traumatic etiology**
	Headache	Chest pain	Abdominal pain	Injuries, burns
Mild pain 1-4 points	ibuprofen 800mg orally i/lub paracetamol 1000 mg orally paracetamol 1000 mg orally 1/	metamizol 2,5g i.v./i.m.	metamizol 2,5g i.v./i.m. + drotaveryna 80mg i.v./i.m. 3/	fentanyl 0,5-1 µg/kg.m.c.i.v./ orally 5,6,/ or morphine 0,1-0,2 mg/kgm.c.i.v./i.o2 ,4/ + non-pharmacological treatment 7/
Moderate pain 5-7 points	ibuprofen 800mg orally i/lub metamizol 2,5g i.v./i.m. lub ketoprofen 100mg i.v.8/ fentanyl 0,5-1 µg/kg.m.c.i.v./ orally 1/	morphine 0,1-0,2mg/kgm.c.i.v./i.o2/ and/or metamizol 2,5g i.v.	metamizol 2,5g i.v./i.m. + drotaveryna 80mg i.v./i.m. 3/	
Severe/extreme pain 8-10 points	fentanyl 0,5-1 µg/kg.m.c.i.v./ orally	morphine 0,1-0,2mg/kgm.c.i.v./i.o2/ and/or metamizol 2,5g i.v.	morfina 0,1-0,2mg/kgm.c.i.v./i.o2,4/ and/or fentanyl 0,5-1 µg/kg.m.c.i.v./ orally	

1/ where CNS bleeding is suspected or contraindications for NSAIDs and/or metamizol are present
2/ in case of ineffective pain therapy, the dose can be repeated every 5 minutes until pain reduction, sedation or qualitative disturbance of consciousness occurs
3/ Drotaverine only in spastic states of the smooth muscle of the digestive tract, urinary tract
4/ in the absence of any contraindications
5/ in case of ineffective pain therapy, the dose can be repeated every 15 minutes until pain reduction, sedation or qualitative disturbance of consciousness occurs
6/ chest injuries should be treated with caution
7/ sterile hydrogel dressings, limb elevation, stabilization of the limb in the axis, etc.
8/ Ketoprofen - make up to 100 ml with 0.9% sodium chloride solutions and serve for 0.5-1 hours Note: intramuscular and rectal analgesics are not recommended in ZRM. Drugs administered this way are characterized by a long

latency period (the time that passes between the administration of the drug and the onset of its action), the concentration of the drug shows a large variation in individual tissue spaces, which can practically cause the ineffectiveness of the therapy.

III. MEDIUM HEADACHE

In case of moderate pain, a combination of ibuprofen with metamizol or ketoprofen may be used. Both drugs are administered intravenously.

Metamizol

Mechanism of action of the drug and contraindications for its use. Metamizol is a drug that has mainly analgesic and antipyretic effects, it also has a weak diastolic effect and very weak anti-inflammatory effects. Metamizol like paracetamol inhibits cyclooxygenase only in the nervous system. Contraindications for its administration are changes in blood morphology - agranulocytosis and leukopenia, liver and kidney failure, pregnancy, congenital deficiency of glucose 6-phosphate dehydrogenase. [6,7]

Ketoprofen

Mechanism of action of the drug and contraindications for its use. Ketoprofen in turn inhibits both COX-1 and COX-2, thus inhibiting the synthesis of prostaglandins. Therefore, it has a strong anti-inflammatory effect. It reduces swelling, lowers fever, has an analgesic effect and also reduces stiffness of joints. It also
inhibits platelet aggregation. It cannot be used in case of kidney and/or liver failure, heart failure, in case of bleeding, in case of hematopoietic system disorders, in women in the third trimester, in children under 18 years of age . [7,8]

Fentanyl

Mechanism of action of the drug and contraindications for its use. Fentanyl is a drug from the opioid group, i.e. drugs acting on opioid receptors in the nervous system. It is used as an anaesthetic and as a painkiller. It has an anti-anxiety and sleeping effect. It cannot be used when the patient takes MAO inhibitors (drugs used to treat depression, hypertension and Parkinsonism). After its application, respiratory depression may occur - the patient must be ventilated. Use with caution in patients with asthma, liver failure, myasthenia, chronic respiratory failure and hypothyroidism. Fentanyl can also be used in case of traumatic pain. [3,4,6,7,9]

Morphine

Mechanism of action of the drug and contraindications for its use . It is also a drug from the opiod group, it has analgesic, coughing, antidiarrheal, intoxicating and depressing effects on the nervous system. Overdose may lead to respiratory failure and coma. It is highly addictive. It cannot be used in case of acute
respiratory failure, drug overdose and atropine poisoning, increased intracerebral pressure and during breastfeeding. Caution should be exercised in case of heart disease, hyperthyroidism and renal and/or liver failure. [3,4,7,10-13]

Oxygen

For the treatment of cluster headaches, oxygen therapy is recommended (100% oxygen, 8-10 L/min for 10/15 minutes). [1,4]

III. CONCLUSION

Competent behaviour of a paramedic at the scene of an accident in a patient with headache requires the paramedic to know the mechanisms of action of the drugs that the paramedic can administer on his/her own and the ability to assess the effectiveness of the analgesic treatment offered.

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